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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/573,822

03/28/2006

Ryoji Hoshi

127516

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25944 7590 07/18/2008

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EXAMINER

RAO, G NAGESH

ART UNIT

PAPER NUMBER

1792

MAIL DATE

DELIVERY MODE

07/18/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/573,822	<b>Applicant(s)</b> HOSHI ET AL.	
	<b>Examiner</b> G. NAGESH RAO	<b>Art Unit</b> 1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 8-23 is/are pending in the application.
- 4a) Of the above claim(s) 9-23 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 8 is/are rejected.
- 7) ☒ Claim(s) 9-23 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 March 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. ____.                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>3/28/06</u> .   | 6) <input type="checkbox"/> Other: ____.                          |

## **DETAILED ACTION**

### ***Claim Objections***

- 1) Claims 9-23 are objected to as being respectively dependent on cancelled claims 1 or 2 or 3. Therefore, claims 9-23 are not currently treated on the merits

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

- 2) Claim 8 is rejected under 35 U.S.C. 102(b) as anticipated by Ono (US Pg Pub No. 2002/0017234).

Ono '234 teaches the fabrication of single crystal silicon crystal ingots from raw material via the Czochralski (Cz) method, whereby it is taught that the single crystal product is produced having a substantially defect free region in the DZ (Denuded Zone) which is generally understood to be in existence outside the OSF region, whereby it is in a radial outwardly form given that the desired intention is to fabricate round single crystal wafers (See Abstract, Sections 0003-0004).

Furthermore Ono '234 teaches a series of cooling rate steps (each of which anticipate the claimed ranges for the temperature rate given the broadness of claimed invention) that fall within the range as prescribed by the claimed invention such as "...the single crystal is a silicon single crystal produced by the Czochralski method by selecting a cooling rate of not less than  $7.3^{\circ}\text{C}/\text{min}$  in the temperature range of  $1200\text{-}1050^{\circ}\text{C}$  (anticipating  $1150^{\circ}\text{C}$ - $1080^{\circ}\text{C}$  range) in the step of pulling up and a cooling rate of not more than  $3.5^{\circ}\text{C}/\text{min}$  in the temperature range of  $1000\text{-}700^{\circ}\text{C}$ . The method of manufacturing epitaxial wafers according to the present invention is characterized in that an epitaxial layer is grown on the surface of silicon wafers sliced from that single crystal.

The rapid cooling in the temperature range of  $1200\text{-}1050^{\circ}\text{C}$ . in the first stage of the cooling step to be controlled in pulling up the second single crystal produces the same effects as the cooling of the first single crystal. Further, the subsequent slow cooling in the temperature range of  $1000\text{-}700^{\circ}\text{C}$  (anticipating  $1050\text{-}950^{\circ}\text{C}$  range). in the next stage is based on the finding from the results shown in FIG. 1 that the oxide precipitate nuclei formed can be grown and rendered more thermally stable by such slow cooling.

Within the temperature range of  $1000\text{-}700^{\circ}\text{C}$  (anticipating the  $950^{\circ}\text{C}$  range)., a slow rate of cooling of not more than  $3.5^{\circ}\text{C}/\text{min}$  is employed, as mentioned above, since as indicated by the results of the pulling rate changing test mentioned above, such cooling rate produces sufficient effects of slow cooling to stably increase the density of oxide precipitates. (See Sections 0031-0033).

### ***Specification***

3. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. **It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited.** The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc. Appropriate correction of the Abstract is required.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to G. NAGESH RAO whose telephone number is (571)272-2946. The examiner can normally be reached on 8:30AM-5PM (INDEPENDENT FLEX SCHEDULE).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, MIKHAIL KORNAKOV can be reached on (571)272-1303. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1792

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

GNR

/G. Nagesh Rao/

7/8/08

/Michael Kornakov/

Supervisory Patent Examiner, Art Unit 1792